

FluidVision® 4000

Measure Monitor Transmit Display



- **Measure flow rates from 0.2 to 227 LPM / 0.06 to 60 GPM**
A rotor spins when liquid flows through the meter. Magnets in the rotor switch a Hall-effect device mounted in the sensor body. The resulting pulse train is converted to flow rate.
- **Measure temperature from -40° to 125°C / -40° to 257°F**
An optional electronic transducer embedded in a stainless steel probe senses the temperature of the flowing liquid. Temperature range is dependent on material selection.
- **Measure pressure to 517, 689, or 1723 kPa / 75, 100, or 250 psi**
An optional temperature-compensated capacitance transducer measures pressure to the maximum rating of the instrument. Pressure range is dependent on material selection.
- **Calibrated output formats are user-selectable**
Select from 0–5 VDC, 0–10 VDC or 4–20 mA output formats for each parameter.
- **Trip points selectable by a 16-position switch for each parameter**
Included relay can provide a redundant safety shut-off.
- **Flow, temperature and pressure status clearly indicated by a tri-color LED**
Green is OK. Red is not OK. Amber provides an early warning.
- **Optional display of all three parameters with selectable units of measure**
Can be integrated in the instrument or remote-mounted.
- **NEMA 4 / IP56 package for use outdoors and in rugged industrial environments**

Flow Temperature Pressure

All three from a
single instrument

FluidVision 4000 Series

instruments measure the flow rate, temperature, and pressure of water, water/glycol mixes, Galden®, Fluorinert™, and many other liquids.

All three transducers are contained in a single sensor unit, providing a compact and simple installation.

FluidVision 4000 Features

LEDs Show Status of All Three Parameters

Bright tri-color LEDs indicate the statuses of flow, temperature and pressure.

If measured value is $> 1.15x$ the flow trip point, the LED will be green.

If the measured value is less than the flow trip point, the LED will be red.

A yellow LED provides a warning that the measured value is in the range of $1x$ to $1.15x$ the flow trip point value.

A yellow LED for temperature or pressure indicates that the measured values are between $0.85x$ to $1x$ the trip point values.

A red LED indicates that temperature or pressure values are higher than the selected trip limits.



Shown with optional digital display

Flow is always indicated in the top line of the optional digital display.

The output value of a second transducer is displayed on the second line of the digital display.

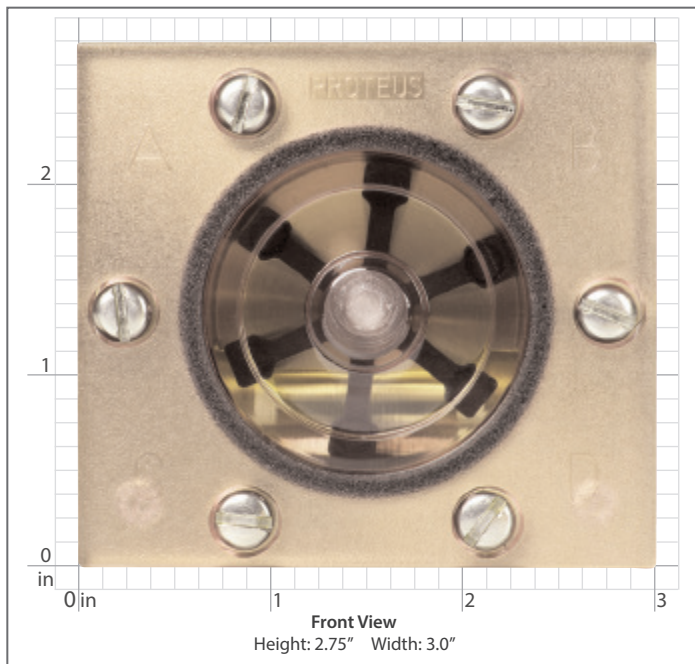
If both temperature and pressure sensors are installed, the second line of the digital display will alternately display the temperature and pressure values and their units of measure.

Trip points for each variable are selectable by a 16-position switch that splits the parameter range into 17 segments.

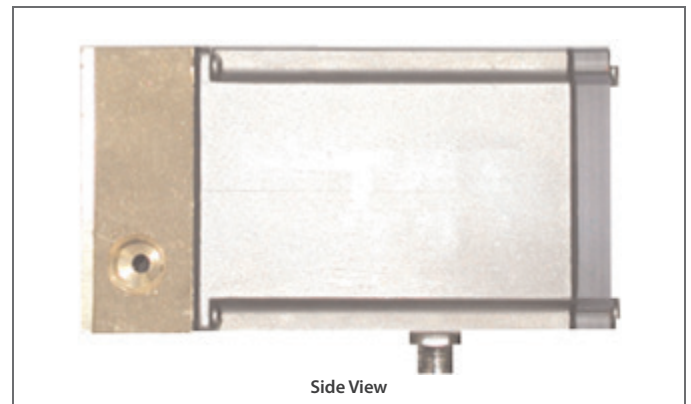
A single-turn potentiometer for fine adjustment is also provided.

High temperature and pressure trip points can be selected without having to heat or pressurize the system to the desired levels.

Compact Package Contains All Three Sensors



Front View
Height: 2.75" Width: 3.0"



Side View

A FluidVision 4000 Series instrument can replace ANY Proteus flow sensor, flow switch or flow meter – the height, width and pipe center locations are identical to those of traditional Proteus flow sensors.

The electronics cover of FluidVision 4000 Series instruments provides rugged NEMA 4 / IP56 protection.

FluidVision 4000 Control Flexibility

Output formats and trip points are independently selectable for flow, temperature and pressure monitoring. Removing four screws and a hefty polycarbonate window provides easy access to the control center for each parameter. The NEMA 4 / IP56 seal is naturally restored when the window is reattached to the unit.



- A single-turn potentiometer provides fine adjustment of the trip points between adjacent switch positions



- An 8-wire cable effects communication between the FluidVision 4000 instrument and your system controller.

Pin No.	Color	Function
1	White	Common/Ground
2	Brown	24 VDC Supply Voltage
3	Green	Relay – Normally Open
4	Yellow	Relay – Common
5	Gray	Relay – Normally Closed
6	Pink	Flow Output
7	Blue	Temperature Output
8	Red	Pressure Output



- The 16-position switch allows trip points for each parameter to be set to predicted values in 6% intervals.
- Trip point selection is precise and repeatable.
- High trip point values for temperature and pressure can be selected without pushing your system to the desired limits.



- Parameter ranges and output format are user-selected by switch position.

Switch Number and State			Output Range
1	2	3	
CLOSED	OPEN	OPEN	0–5 VDC
OPEN	CLOSED	OPEN	0–10 VDC
OPEN	OPEN	CLOSED	4–20 mA

FluidVision 4000 Capabilities

Matching an Instrument to Your Flow Control Task

1. Check operational temperature and pressure limits to identify suitable materials.
2. Select a flow meter material that is chemically compatible with your liquid.
3. Select a flow range so that
 - a. Your nominal flow rate is around 50–60% of the upper flow limit of the instrument.
 - b. Your maximum flow rate is less than the upper flow limit of the instrument.
 - c. If required, your trip point flow is not less than the stated low flow value.
4. Select SAE connections for use with specialized coolants such as Galden or Fluorinert or for the connection of positionable elbows.

Need help? Contact Proteus Technical Support at (650) 964-4163 or tech@proteusind.com.

Flow Ranges, Connections and Materials

Flow Range		Connection	Model Number		
LPM	GPM		Brass	Stainless Steel	Polypropylene
0.2 – 2.3	0.06 – 0.6	¼" FNPT	04004BN06-XXX	04004SN06-XXX	04004PN06-XXX
0.4 – 5.3	0.1 – 1.4	¼" FNPT	04004BN1-XXX	04004SN1-XXX	04004PN1-XXX
0.95 – 9.5	0.25 – 2.5	¼" FNPT	04004BN2-XXX	04004SN2-XXX	04004PN2-XXX
0.95 – 9.5	0.25 – 2.5	⅙ - 18 SAE		04006SA2-XXX	
1.1 – 17	0.3 – 4.5	¼" FNPT	04004BN4-XXX	04004SN4-XXX	04004PN4-XXX
1.1 – 17	0.3 – 4.5	⅙ - 18 SAE		04006SA4-XXX	
2.3 – 34	0.6 – 9.0	⅜" FNPT	04006BN9-XXX	04006SN9-XXX	
2.3 – 38	0.6 – 10	⅜" FNPT			04006PN10-XXX
3.0 – 38	0.8 – 10	¾ - 16 SAE		04008SA10-XXX	
5.3 – 53	1.4 – 14	½" FNPT	04008BN14-XXX	04008SN14-XXX	04008PN14-XXX
4.5 – 61	1.2 – 16	¾" FNPT	04012BN16-XXX	04012SN16-XXX	
4.5 – 61	1.2 – 16	1 ⅙ - 12 SAE		04012SA16-XXX	
5.7 – 72	1.5 – 19	¾" FNPT			04012PN19-XXX
11 – 151	3.0 – 40	¾" FNPT	04012BN40-XXX	04012SN40-XXX	
15 – 151	4.0 – 40	1" FNPT	04016BN40-XXX	04016SN40-XXX	
15 – 151	4.0 – 40	1 ⅙ - 12 SAE		04016SA40-XXX	
15 – 189	4.0 – 50	1" FNPT			04016PN50-XXX
19 – 227	5.0 – 60	1" FNPT	04016BN60-XXX	04016SN60-XXX	

Temperature and Pressure Operating Limits

Flow Body Material	Faceplate Material	Temperature Limit ¹		Pressure Limit ²	
		° C	° F	kPa	psi
Polypropylene	Clear Polysulfone	70	158	517	75
Brass	Clear Polysulfone	100	212	689	100
	Brass	125	257	1723	250
Stainless Steel	Clear Polysulfone	100	212	689	100
	Stainless Steel	125	257	1723	250

¹FluidVision 4000 Series electronics are rated for operation to 85°C (185°F). At higher temperatures, the electronics unit must be mounted remotely from the flow, temperature and pressure sensor unit. Contact Proteus Technical Support for additional information.

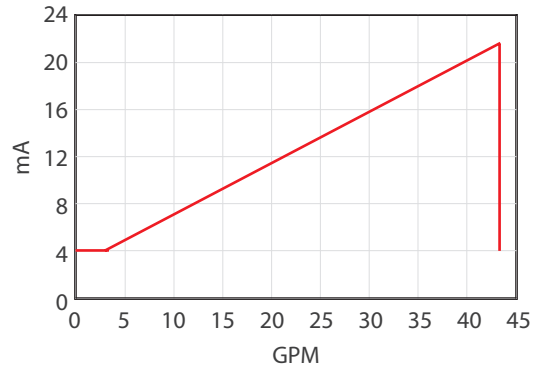
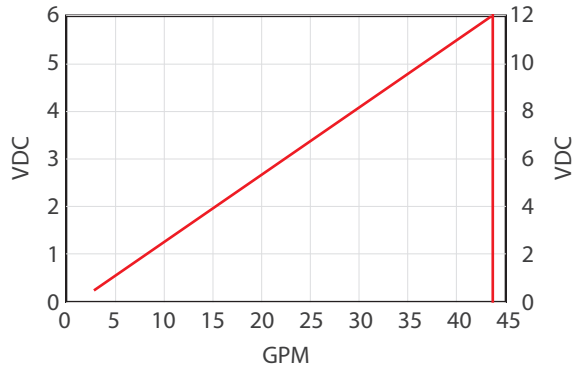
²The compensated calibration range of the pressure sensor in standard FluidVision 4000 Series instruments is 0°C to 82°C (32°F to 180°F). Custom calibration for higher or lower temperatures is available. Contact Proteus Technical Support for information.

Wetted Materials

Component	Available Materials	
	Standard	Optional
Rotor	PPS	Kynar®
O-Ring	Viton®	Silicone Rubber
Rotor Shaft	316 Stainless Steel	Alumina

Typical Flow Response

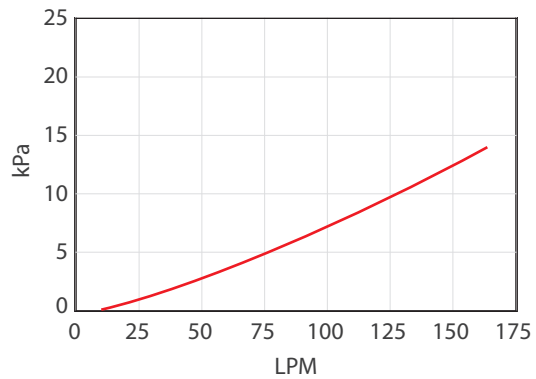
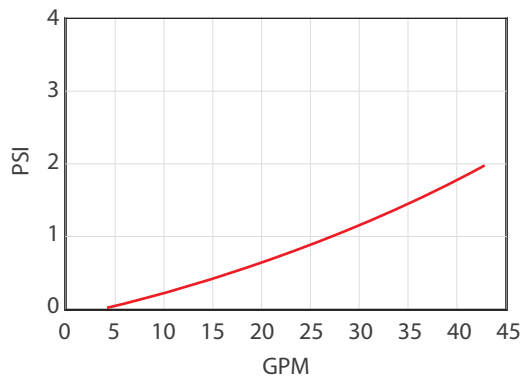
- Output format is user-selectable. Choose from 0–5 VDC (default), 0–10 VDC or 4–20 mA output formats.
- Over-range protection causes output to drop to 0 VDC or 4 mA if the measured flow exceeds the flow capacity of the instrument.
- To request flow response curves for each instrument type, contact tech@proteusind.com.



Flow response curves for 04012BN40-XXX and 04012SN40-XXX instruments.

Pressure Drop

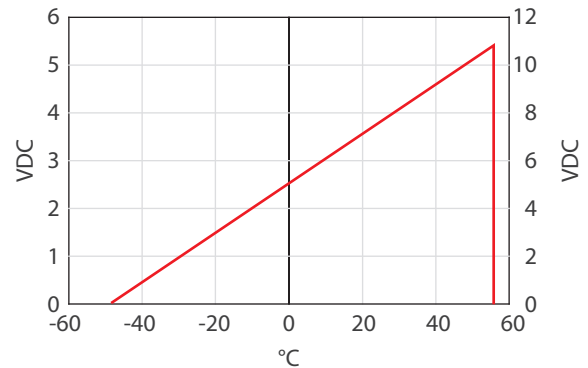
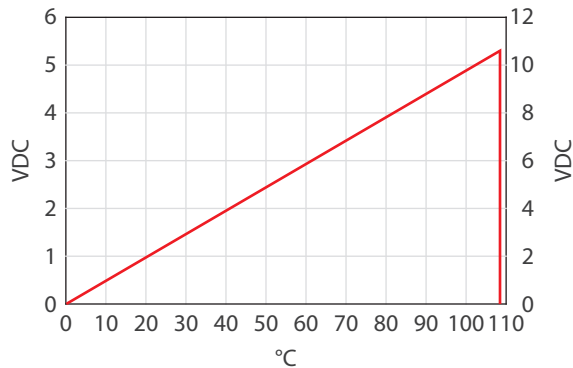
- Typically less than 69 kPa (10 psi) at the maximum rated flow rate of each instrument.
- Typically less than 6.0 kPa (1 psi) at 40% of the maximum flow rate of each instrument.
- To request pressure drop curves for each instrument type, contact tech@proteusind.com.



Pressure drop curves for 04012BN40-XXX and 04012SN40-XXX instruments.

Temperature Response

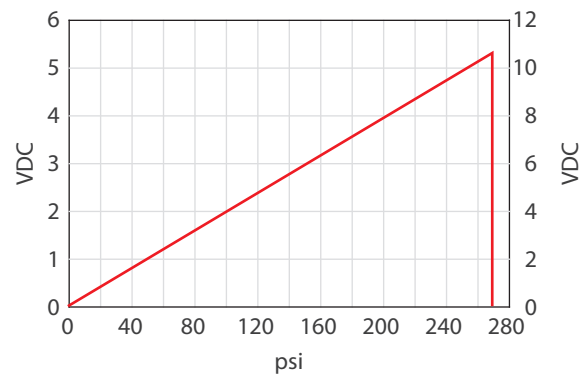
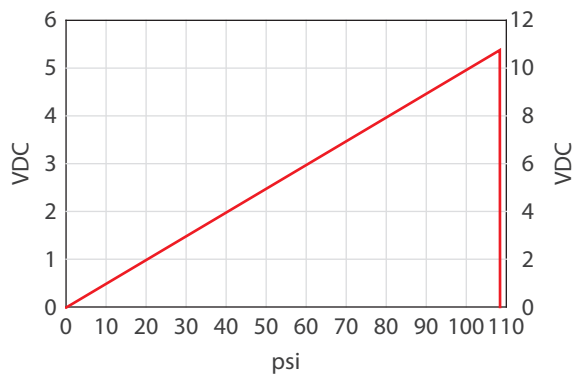
- Output format is user-selectable. Choose from 0–5 VDC (default), 0–10 VDC or 4–20 mA output formats.
- Temperature ranges and zero offsets are switch-selectable to allow sensitive monitoring of temperatures as low as -40°C (-40°F).
- Temperature range is dependent on the selection of flow sensor and faceplate materials.
- Over-range protection causes output to drop to 0 VDC or 4 mA if the measured temperature exceeds the temperature capacity of the instrument.
- To request temperature response curves for each instrument type, contact tech@proteusind.com.



Temperature response curves for 04012BN40-XXX and 04012SN40-XXX instruments.

Pressure Response

- Output format is user-selectable. Choose from 0–5 VDC (default), 0–10 VDC or 4–20 mA output formats.
- Pressure range is dependent on the selection of flow sensor and faceplate materials.
- Over-range protection causes output to drop to 0 VDC or 4 mA if the measured pressure exceeds the pressure capacity of the instrument.
- To request pressure response curves for each instrument type, contact tech@proteusind.com.



Pressure response curves for 04012BN40-XXX and 04012SN40-XXX instruments.

FluidVision 4000 Performance Characteristics

What They Really Mean

The capability of FluidVision 4000 instruments can be qualified by three characteristics for each of the three measured parameters:

ACCURACY – The closeness of an indicated value to the actual value.

Accuracy is expressed as $\pm\%$ of the highest value at which the calibration adjustment is made.

LINEARITY – The closeness of a calibration curve to a best-fit straight line.

Linearity is expressed as the maximum measured deviation of any calibration point from the ideal response line during a single calibration cycle.

REPEATABILITY – The ability of the instrument to reproduce readings when the same measured value is presented to it consecutively, under the same conditions, and in the same direction.

Repeatability is expressed as the maximum difference between output readings.

How They Are Reported

The measurement capability of each FluidVision 4000 instrument is stated on a Certificate of Conformance delivered with each unit. A Calibration Certificate providing improved accuracy at a single calibration point is available at additional cost.

Calibration & Measurement Uncertainty

Accuracy specifications for the FluidVision 4000 instruments include the uncertainty of our calibration process. Uncertainty statements for flow, temperature and pressure calibrations are available on request.

Flow Measurement Capability

Accuracy $\pm 3\%$ of full scale is stated on a Certificate of Conformance.
Flow response is adjusted at high and low reference flows selected on production standards whose response is controlled to $\pm 1\%$ of their range.

Accuracy of $\pm 1\%$ of reading can be stated for a single flow point on a Calibration Certificate. This calibration adjustment is referenced to a flow standard whose response is controlled to $\pm 0.5\%$ of the selected flow point. Calibrations are made with water at temperatures from 22° to 28°C.

Linearity $\pm 1.5\%$ of full scale from 0.1 to 1.0x the flow range.

Repeatability $\pm 1\%$ of full scale from 0.1 to 1.0x the flow range.

Temperature Measurement Capability

Accuracy $\pm 3\%$ of full scale is stated on a Certificate of Conformance.
Temperature response is adjusted at high and low reference temperatures selected on production standards whose response is controlled to $\pm 1\%$ of their value.

Accuracy of $\pm 1\%$ of reading can be stated for a single temperature point on a Calibration Certificate. This calibration adjustment is referenced to a temperature standard whose response is controlled to $\pm 0.2\%$ of the selected value.

Linearity $\pm 1\%$ of full scale from 0.1 to 1.0x the temperature range.

Repeatability $\pm 0.5\%$ of full scale from 0.1 to 1.0x the temperature range.

Pressure Measurement Capability

Accuracy $\pm 3\%$ of full scale is stated on a Certificate of Conformance.
Pressure response is adjusted at high and low reference pressures selected on production standards whose response is controlled to $\pm 1\%$ of their value.

Accuracy of $\pm 1\%$ of reading can be stated for a single pressure on a Calibration Certificate. This calibration adjustment is referenced to a pressure standard whose response is controlled to $\pm 0.2\%$ of the selected value.

Linearity $\pm 1\%$ of full scale from 0.1 to 1.0x the pressure range.

Repeatability $\pm 0.5\%$ of full scale from 0.1 to 1.0x the pressure range.

Electrical Specifications

Power Requirements	24 \pm 10% VDC, 200 mA
Over-Voltage Protection	A resettable thermal fuse turns unit OFF if input voltage exceeds 29 VDC
Electrical Connection	2 m 8/24 AWG PVC insulated cable, rated 1.5 A at 36 VDC (included)
Switch Type	Relay Closure, Normally Open and Normally Closed contacts
Relay Rating	SPDT, 1 A at 48 VDC

Dimensions and Drawings

Outline drawings and product dimensions are available on the Proteus Industries website at www.proteusind.com/4000. Contact tech@proteusind.com to request drawings by e-mail.

Need more information?

- Download and review the FluidVision 4000 Technical Reference Manual at www.proteusind.com/4000.
- E-mail tech@proteusind.com
- Call (650) 964-4163 and ask for Technical Support. A flow-measurement expert will be pleased to answer your questions!

Need specialized measurement capability? We welcome your challenge!

We'll create it for you! Our diverse list of customization options includes hoses, tubing, face-seal and SAE connections, fitting of special cables and labeling with your part numbers and operating parameters.

- E-mail tech@proteusind.com
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